

Internal Correspondence

MARTIN MARIETTA

#135

MARTIN MARIETTA ENERGY SYSTEMS, INC.

October 12, 1990

M. W. Kohring

Information for Tiger Team Safety and Health TSA

Per your request by E-Mail of 1 October, the requested information for Buildings 3019A, 4501, 7920, and the Isotope Area Buildings, 3026C, 3033, 3038, 3047, and 3517 is enclosed. Since the nature and intensity of operations varies considerably in these facilities, there is considerable variation in the character of the information provided.

W. W. Pitt, Jr.

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Chemical Technology Division

#135

## BUILDING 3019A RADIOCHEMICAL DEVELOPMENT CENTER

### 1. Training and Certification Activities for Last Two Years

- Facility operations - 5 persons with 5 years or greater experience are qualified to conduct surveillance and other operations in the facility. All have completed General E S & H, Radiation Worker, and Waste Disposal Training within last two years.
- Health Physics Technicians - 2 trained on Facility OSR; average score 100; no failures.
- I & C Technicians - 25 trained on Facility OSR; average score 85; no failures.
- P & E crafts and others - 47 received "Do's and Don'ts" training allowing supervised access.

### 2. Operations Expected During the Assessment Period

This facility will be in a shutdown condition under surveillance during the assessment period. Some program maintenance activities will be conducted by P & E and I & C technicians.

### 3. Operating History for Past Two Years

- Removed glove boxes from Rooms 110, 112, and Penthouse
- Changed filters in 3108, GBOG, and Room 142
- Secured glove boxes in Room 22
- Moved archive samples to storage wells
- Packaged and shipped 18g U-233 to ANL West
- Removed abandoned vacuum line from Room 110
- Received and placed in storage 3 casks containing Sr-90 and Cs-137 and also core samples of Melton Valley Storage Tank

FISSION PRODUCT RELEASE FROM LWR FUEL PROJECT  
BUILDING 4501 HOT CELLS

1. TRAINING AND CERTIFICATION OF FACILITY OPERATORS

- Personnel training for the experimental effort studying fission product release from LWR fuel under accident conditions is conducted annually. Since no new personnel have joined this project since its inception and the original training, only re-training and re-certification of experienced personnel has been necessary.
- Because this project has required very little support from P&E craftsmen since its original construction, no training of these support personnel has been conducted. Any work done by other than a certified operator has been directly supervised by a certified operator and/or the health physics surveyor to insure both high quality work and compliance with all radiation control regulations.
- Statistics

<u>Year</u>	<u>Number Trained</u>	<u>Number Certified</u>	<u>Number Tests Failed</u>	<u>Average Test Scores</u>	
				<u>Technicians</u>	<u>Research staff</u>
1989	5	5	0	98	99
1990	5	5	0	97	97

2. OPERATIONS EXPECTED DURING THE ASSESSMENT PERIOD

No specific laboratory operations other than routine monitoring are planned for the assessment period. As a result of reduced funding, the efforts of the personnel in this group have been directed to other areas.

3. OPERATING HISTORY FOR PAST TWO YEARS

Prepared Test VI-4	Jan — May 1988
Conducted Test VI-4 (2400 K in hydrogen)	May 1988
Disassembled, examined, sampled, analyzed, evaluated, and reported Test VI-4	May — Dec 1988
Prepared Test VI-5	Jan — May 1989
Conducted Test VI-5 (2700 K in hydrogen)	May 1989
Disassembled, examined, sampled, analyzed, evaluated, and reported Test VI-5	May 1989 — Sept 1990

No occurrences, incidents, contaminations of personnel, or over-exposures of personnel have occurred during this project. The only downtime experienced in the last two years resulted from electronic problems with the Ge(Li) detector — multichannel analyzer system used in gamma analysis of test components and samples.

## High Alpha Laboratory, Building 4501, Rm. 127

### 1. Training and Certification

- Personnel training for operations in the High Alpha Facility is conducted according to the guidelines in the Personnel Training Program for Glove Box Operations in Building 4501, Room 127, Alpha Facility, ORNL/CF-84/241. (Attachment 1.)
- A recertification meeting is held annually to review current procedures, discuss any problem areas, and complete a written review examination. Documentation of these meetings is forwarded to the Chemical Development Section Head listing the current personnel with active certification, these being L. M. Toth, L. K. Felker, and S. P. Cooper. (Attachment 2.)
- A written exam was administered by L. M. Toth (Facility Supervisor) and reviewed with operating personnel and the area health physics representative. The average score on the exam was 88%. (Attachment 3.)
- I&C conducts a training program for their personnel and a memo outlining the procedure is attached. (Attachment 4). No significant work by P&E personnel has been conducted in the past two years.

### 2. Current Operations

- No specific operations are planned for the period during the assessment.
- Some facility maintenance or calibrations may be scheduled at a later date.

### 3. Operating History

- A listing of maintenance, calibrations, and inspections has been maintained since June of 1989. (Attachment 5).
- A log of research activities over the past two years is included. (Attachment 6).
- Two instances of irregularities in the standard operation are attached.

The first deals with fluctuations in the off-gas control which was solved by recalibration of the controller and the changing of the room exhaust filter.

The second was the failure of the A/C system due to a compressor burnout. The fans were restarted without the compressor running to provide circulation of room air through the HEPA filters. The compressor was replaced and normal operation was resumed.

## Internal Correspondence

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MARTIN MARIETTA ENERGY SYSTEMS, INC.

October 9, 1990

W. W. Pitt

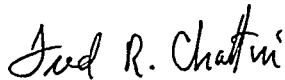
### Operations and Maintenance Activities at Building 7920, 1988-1990

Building 7920 of the Radiochemical Engineering Development Center (REDC) is the production, storage, and distribution center for the heavy-element research program of the U.S. Department of Energy (DOE). As such, the baseline program for Building 7920 involves fabrication of actinide targets for irradiation in the High Flux Isotope Reactor (HFIR) and, after irradiation in HFIR, processing the targets to recover the heavy elements, primarily  $^{249}\text{Bk}$ ,  $^{252}\text{Cf}$ ,  $^{253}\text{Es}$ , and  $^{257}\text{Fm}$ .

After processing a batch of targets following the shutdown of HFIR in November 1986, Building 7920 has generally been maintained in normal operational status, awaiting the restart of HFIR. However, certain maintenance activities were elected that did temporarily interrupt the normal operational status. These interruptions were scheduled with the maintenance to be performed and were usually of short duration (less than 1 day) and occurred throughout the period since the HFIR shutdown. Scheduled maintenance items that were allowed to affect the operational status included various aspects of the ventilation system refurbishment, the extensive painting in the building, and the replacement of the floor covering in the control room and corridors.

A list of operational activities, maintenance items, and other staff involvements for the period since the HFIR shutdown is attached. In addition, there were preparations for a supplemental program, the processing of irradiated Mark 42 elements from the Savannah River Site for the recovery of  $^{243}\text{Am}$ . The preparations included both small experimental runs in the hot cells for flowsheet development and extensive modifications and additions to the building equipment for handling carriers in order to receive the Mark 42 elements.

During the assessment period, Building 7920 will remain in normal operational status. Operations necessary to maintain this status, instrument calibrations, and programmed maintenance items will continue through this period. Calibrations and programmed maintenance activities are normally scheduled around more demanding maintenance activities if the need arises.



F. R. Chattin, 7920, MS-6384 (4-7071)

FRC:sco

Attachment

cc/att: E. D. Collins  
L. J. King  
File

October 9, 1990

W. W. Pitt

REDC Training and Certification Activities October 1988-October 1990

The REDC Training Group is responsible for all training of the Processing Group Process Supervisors and Technicians except for the ES&H training done on an ORNL wide basis. This includes general facility safety, building systems, facility specific compliance and mandatory training, as well as the processing equipment, operations, and procedures.

After an initial 8-week training sequence, a new technician is assigned to one of the shifts where he will continue training mostly as on-the-job training. Every two years, a "Training Campaign" is held to retrain/requalify experienced technicians (and process supervisors) or to serve as another part of initial qualification training for new technicians. This "Campaign" usually lasts 2 weeks and includes instruction in about 60 training modules which encompass most of the tasks that are performed by the processing personnel. The last "Campaign" was held in February 1989 when 15 people were trained, in 2 groups, during a 3-week period. The average score of the 165 exams given was 91.3% including 2 failures. Of the 15 attendees, 7 were up for requalification (and requalified) and for 6 of the trainees this served as part of their initial qualification. Two of the attendees are no longer at the facility.

Annual, Abnormal and Emergency Conditions Training, given during the 1989 "Campaign", was also given in June 1990. The training was documented separately this year, rather than being a part of another section test, as it had been in the past. There were 13 trainees, 13 exams given, with an average score of 80.35%, including 3 failures.

Facility-specific REDC Waste Handling Procedures Training was given in March 1990. This training is given to all personnel who might handle any kind of waste in the facility and certain first line supervisors. 46 people were trained including 4 P&E and E&HP personnel. The average score on the 46 exams was 93.2% including 1 failure.

The REDC Training Group is only responsible for facility-specific training for the assigned P&E, I&C and Health Physics personnel. The training that these personnel receive therefore consists of the REDC Access/Orientation/Safety training that is given to all personnel who require access to the REDC whether temporarily or permanently assigned to the REDC. This training has been given to ~400 people in the 1988-90 period of which ~230 were P&E, I&C, or E&HP personnel. There were no failures of these exams.

  
D. B. Owsley, REDC Training Specialist, 7965A, MS-6384 (4-7071)

cc: E. D. Collins  
L. J. King  
File

## REDC FOLLOWING HFIR SHUTDOWN

- HFIR Shutdown November 1986
- HFIR Restart a Moving Target
- 1987 Not Unusual
  - Transuranium Element Processing
  - Rework Solution Processing
  - $^{240}\text{Pu}$  Purification
  - Replaced Disconnect Plate and Jumpers in Cubicle 7
  - Extensive Solid Waste Removal
  - Cubicle 9 Window Removed and Cleaned
- Ventilation Review Started as Study for FSAR
- Conceptual Design of Target Fabrication
- Produced  $^{24}\text{Na}$  Using  $^{252}\text{Cf}$  to Irradiate Aluminum

## REDC 1988-1990

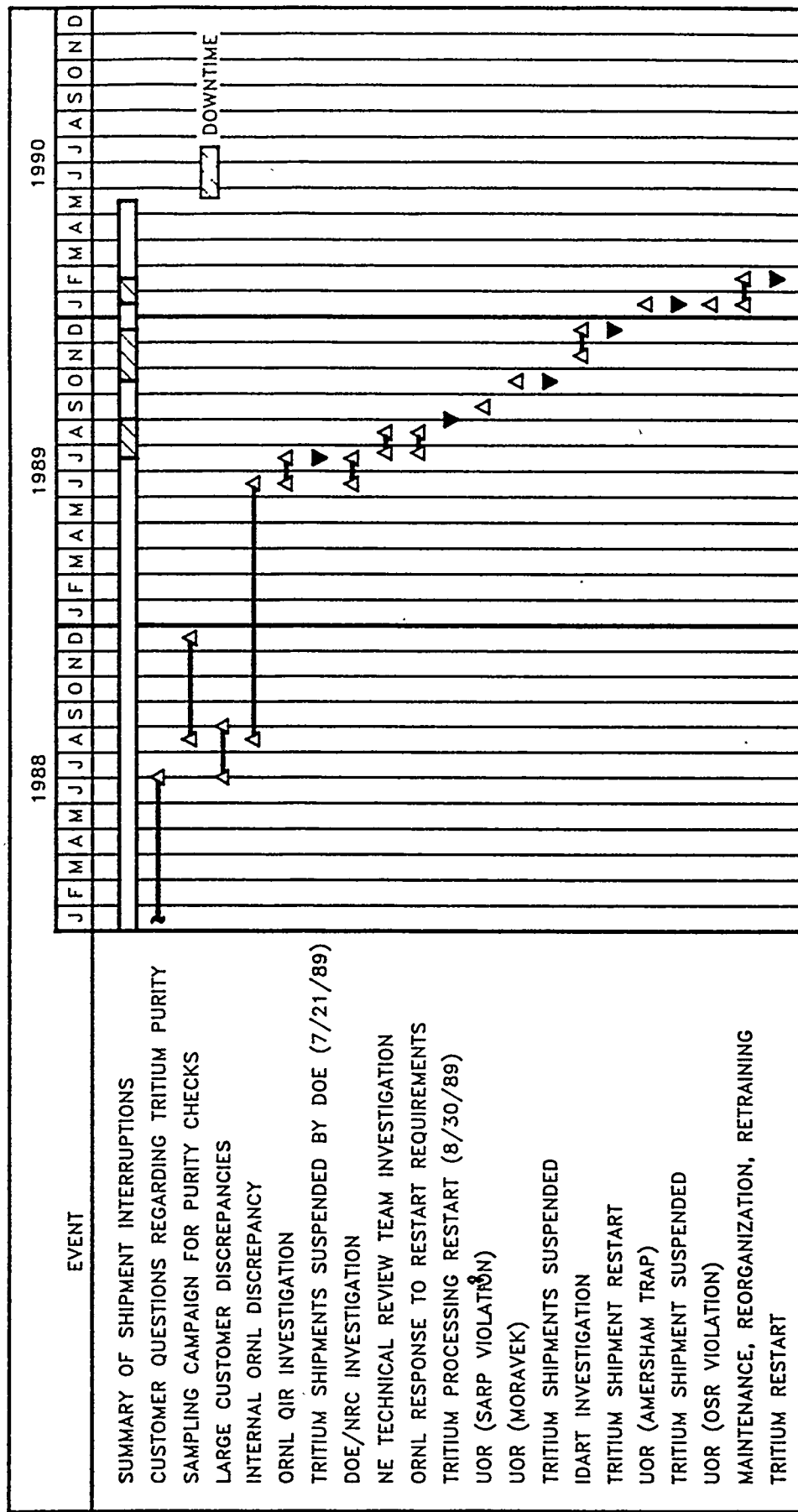
- HFIR Restart Remained Significant Factor
- Increasing Attention to "New Culture" and Involvement in Reviews at All Levels
- Ventilation Review Becomes Refurbishment
  - Repaired Backflow Preventers in Hot-Cell Intakes
  - Refurbished Building Exhaust Filter Plenums
  - Rebuilt 3 Building Supply Systems
  - Purchased 26 Backdraft and Control Dampers
  - Design New COG Filter Housings for 7920/7930
  - Cooperative Study of DOP Testing
  - Ventilation Systems Walkdowns and As-Builts
- Target Fabrication Refurbishment
  - Designed, Tested, and Installed Pellet Equipment
  - Cleaned Out Cubicle 3 - Waste Removal
  - Rebuilt Leak-Test Systems
- Process Development for Waste Characterization
- Quality Assurance Program Plans (NQA-1)
  - Transportation
  - Maintenance and Modification of Hot-Cell Support Systems
  - Operations and Maintenance in Hot Cells and Related Areas

REDC 1988-1990  
(continued)

- Environment, Safety, and Health Upgrade
  - Formulated Plan and Made Progress in Many Areas
  - Instituted Access Training
  - H.P. Instrument Upgrade
  - Improved Signs, Zoning, Frisking
  - New Training and Office Trailer
  - OSHA and EPA Compliance
- Document Control Center Established
- Walkdown of Makeup Area Systems - Removed Obsolete Piping
- Recovered 3 mg of  $^{252}\text{Cf}$  from 7930 Waste Tank
- Removed 9 Obsolete Glove Boxes
- Rebuilt Control System for Hopcalite-Charcoal Iodine Treatment System
- Designed Upgrade for Shielded Caves
  - Cave Ventilation and VOG Upgrade
- Extensive Painting Inside and Out
- Replaced Floor Covering in Control Room and Corridors

REDC 1988-1990  
(continued)

- Staff Involvement in ORNL Matters
  - Low Level Liquid Waste System
  - Federal Facilities Act
  - Training and Training Program Accreditation



## Isotope Area Facility Operator Training and Certification Activities During the Past 2 Years

Shown below is the operator training and certification for the designated facilities. Not included on this is the general training of personnel received from the Technical Resources and Services Training Section of the Environmental and Health Protection Division. It should also be pointed out that where there is no supervisor examination average score, the personnel were exempted from the exams. Approximately 126 personnel from various divisions received the Radiochemical Technology area "Dos and Don'ts" training. This would include the I&C technicians and P&E craft.

<u>Facility</u>	<u>Number Trained</u>	<u>Number Certified</u>	<u>Failed Test</u>	<u>Average Score Operators/ Technicians</u>	<u>Average Score for Supervisors</u>
3033	4	4	1*	87	Exempt
3026-C	4	4	1*	87	Exempt
3517	6	6	0	96	91
3038 Packing and Shipping	4	4	0	98	92
3038 East Lab	3	3	0	97.5	Exempt
3047	1	1	0		Exempt

\* Passed on retest.

Certification time for these facilities varies with the workload.

## Information for Tiger Team Safety and Health TSA

### Building 3038

1. Description of operations, maintenance and other work that is expected to be in progress during the assessment period.

#### Response:

- a. **Radioactive Materials Shipping and Packaging (RAMSPAC)** operations will be routine packaging and preparation for shipping of radioactive materials. Shipping activities are restricted to Monday through Thursday. No maintenance activities other than routine activities are planned in this facility.
- b. **Radioactive Materials Receiving** operations will be routine receipt of radioactive materials and empty container shipments. No unusual maintenance activities are planned in this facility.
- c. **Alpha Handling Facility (AHF)** operations will include the loading and welding of an americium-241 shipping capsule in cells four and five during the period of October 8 through October 19, 1990. This work is expected to be completed before the beginning of the Tiger Team visit, however, clean-up from the work could be in progress at the time of the visit. Work planned for the immediate future in this facility includes the removal and storage of approximately 150 grams of plutonium-238 as oxide material stored in the cells and general clean-up of the cells. There is presently no schedule for these operations and the actual work depends on availability of personnel to do the work.
- d. **Alpha Handling Facility Annex (AHFX)** operations will be routine load-out of isotope materials. Operations in this facility will be dependant on receipt of orders. No unusual maintenance activities are planned in this facility.
- e. **Low-level Laboratory** operations are restricted to issue of C-zone clothing. An issue station for respirators and masks will be established in this facility when training of issuing personnel is complete. This issue station may be in operation when the Tiger Team visits. No unusual maintenance activities are planned in this facility.
- f. **East Laboratories** operations are limited to surveillance and clean-up activities. Certain hoods and glove boxes in the laboratories are used at the present time to handle radioactive materials which are recovered or removed from other defunct isotopes operations and need to be repackaged for permanent storage or packaged for waste.

- g. **Hot Cell Area** operations have ceased as of September 30, 1990. This cell was most recently used for processing yttrium-90 for sale. Surveillance of the facility will continue and clean-up operations will be in progress as personnel are available.

In addition, the several maintenance items listed below have been requested for Building 3038 and may be in progress during the team visit to ORNL.

- a. Remove security camera cabinet and supports in RAMSPAC area.
  - b. Replace electrical panel screws which are missing.
  - c. Remove and replace asbestos insulation on pipe.
  - d. Install sign posting limits on monorail hoists.
  - e. Identify and mark all piping in east end of building.
2. Operating history of the facility for the past two years, with explanation of downtimes, scheduled or unscheduled.
- a. **RAMSPAC** operations have been routine for the past two years with no scheduled or unscheduled downtime.
  - b. **Radioactive Materials Receiving** operations have been routine for the past two years with no scheduled or unscheduled downtime.
  - c. **AHF** operations in cells one and two have been discontinued during the past two years due to lack of demand for the product produced there ( $^{234}\text{U}$ ). The operations in cells four and five included the fabrication three plutonium-238/beryllium neutron sources and will be the location of the fabrication of the americium-241 shipping capsule during the next several weeks. Cell three is used for putting equipment into the other cells and is not used for processing activities.
  - d. **AHFX** operations have been routine for the past two years with no scheduled or unscheduled downtime.
  - e. **Low-level Laboratory** operations were halted in September 1989 when the program experiments that were routinely performed in this laboratory discontinued for lack of funding. Since that time operations have been restricted clean-up of the laboratory and removal of old chemicals for disposal. The laboratory has recently been designated as a distribution point for C-zone clothing and will hold a mask and respirator distribution point for the Isotopes Area when it is established and training for personnel is complete.

- f. **East End Laboratories** operations were limited to completing orders in progress in October 1989 with the demise of the isotopes program. These limited activities continued until March 1990. Activities in this area since that time have been limited to surveillance, removal and salvage of equipment, and certain clean-up activities. Certain hoods and glove boxes in the facility are used periodically to repackage radioactive materials for storage or packaging for waste.
- g. **Hot Cell Area** operations were suspended on September 30, 1990. Activities in this area prior to that time included the processing of yttrium-90 from a strontium-90 cow for sale to customers. A shutdown of the facility occurred in January 1989 for approximately one month and again on March 2, 1990 for approximately two months to address safety concerns of the operation and the hot cell facility.

**Building 3517**

1. Description of operations, maintenance and other work that is expected to be in progress during the assessment period.

**Response:**

Operations and maintenance activities expected to be in progress during the assessment period include routine surveillance and maintenance. Work will also be in progress to remove waste materials from the cells. In addition, the several maintenance items listed below have been requested for Building 3517.

- a. Repair chilled water compressor.
- b. Repair leaks and install valves to waste tank steam jets.
- c. Repair steam leak on heating unit coil.
- d. Repair broken line outside above waste storage tanks.
- e. Repair or replace sheet metal siding on west airlock.
- f. Remove abandoned water lines from south side of building.
- g. Plug holes in inside walls which were left when old duct work was removed.
- h. Upgrade and identify all electrical panels, switches and outlets to meet OSHA standards. (In progress)
- i. Replace rusted-out down comers from roof and repair roof leaks.
- j. Remove argon storage tanks and support framework from northwest outside of building.
- k. Plug drain line on first level southwest.
- l. Remove or secure all loose and broken asbestos in building.
- m. Replace emergency relief damper to secondary containment of building.
- n. Remove excess piping and old high pressure gas station at southwest corner outside building.
- o. Replace cotton rope support on intake duct to service tunnel.
- p. Put head bump cushion on emergency light in southwest mezzanine.

- q. Remove piping to electropolisher equipment in bay area.
  - r. Remove distilled water tank and pump in southwest mezzanine.
  - s. Remove plywood cover and fill hole behind compressor in compressor room.
  - t. Install guard on pump shaft in compressor room.
  - u. Inspect all ladders in building.
2. Operating history of the facility for the past two years, with explanation of downtimes, scheduled or unscheduled.

Response:

The Fission Products Development Laboratory facility was placed in safe standby in April 1989 after an examination of the seismic evaluation of the facility revealed that a potential unsafe condition existed. Prior to that time the facility was used for the purification of cesium-137 chloride and fabrication of this material into sources for sale in the commercial market. The facility operation presently consist of routine surveillance and maintenance.

## Information Requested by Safety and Health TSA Team

### Building 3026C

*Description of operations, maintenance, and other work that may be in progress during the assessment period.*

#### Normal Operations

- Continuation of loading of  $^{85}\text{Kr}$  product shipping cylinders for customers.
- Health and Safety Division's Medical Isotopes Section may process a tungsten target (approximately 4 h hot cell work).

#### Maintenance

- Recalibration by I&C of the instruments in the  $^{85}\text{Kr}$  storage facilities and loadout station may be in progress.

*Operational history of the facility for the past two years.*

Thermal diffusion runs to enrich Krypton product in  $^{85}\text{Kr}$  were performed from January through March and October through December of 1989. Normal krypton product loading and shipping operations were conducted during this two year period. The thermal diffusion enriching columns were officially declared out of service on 5/9/90 due to a decision by the DOE Isotopes Program Manager to relocate the krypton operations at another federal facility.

Routine operations have occurred for the past two years in the Health and Safety Division's Medical Isotopes Section. Processing several short-lived isotopes for medical research development.

## Building 3033

*Description of operations, maintenance, and other work that may be in progress during the assessment period.*

### Normal Operations

- Preparations of tritium shipping cylinders for waste disposal will continue during this review period.

### Maintenance

- No maintenance or other work is anticipated during the review period.

*Operational history of the facility for the past two years.*

Tritium operations during the past two years included routine loading and shipping of tritium. Facility shutdown intervals and explanations are given in the attached time chart.

Purification runs of krypton feed stock in preparation for thermal diffusion column runs in Building 3026C were conducted in September 1989. The krypton purification process in Building 3033 was officially declared out of service on 5/9/90 due to a decision by the DOE Isotopes Program Manager to relocate the krypton operations at another federal facility.

## Building 3047

*Description of operations, maintenance, and other work that may be in progress during the assessment period.*

### Normal Operations

- Decontamination of Cell B and C may be in progress.

### Maintenance

- No maintenance is scheduled.

*Operational history of the facility for the past two years.*

During 1988, the last processing of  $^{153}\text{Gd}$  was completed. Cell D was decontaminated to a point where sludge in the ventilation sump pit was determined to be the major source of radiation in the cell. Special sludge removal equipment was designed, fabricated, and tested. Decontamination work was halted because of a lack of funding. RSI project began in July of 1988. Decontamination of the alpha hot cell in Room 110 began.

During 1989, RSI work continued, Cell A decontamination work began, and an americium shipment was transloaded for the REDC. The hot cell facilities in the building were designated as being included as a part of the Isotope Facility Shutdown Program. The  $^{14}\text{C}$  work was resumed and then was canceled by the DOE Isotopes Program Manager.

During 1989, RSI work was completed. The decontamination of Cell A was completed. Support was given to the Nuclear Medicine Group of Health and Safety Research Division in unloading an  $^{190}\text{Os}$  HFIR target. A second americium shipment was transloaded for REDC.